

# INTRODUCTION

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## Overview

This report, the 10th in a series of Congressionally mandated biennial publications, documents both short- and long-term trends in the participation of women, minorities, and persons with disabilities in science and engineering education and employment. Its primary purpose is as an information source; it offers no endorsement or recommendations on policies or programs.

The report aims to examine changes in participation since the first report in this series was released in 1982. Despite the many changes that have occurred since then, several of the findings reported therein (NSF 1982) continue to hold true. Among these are the relatively small percentages of women and minorities who earn science and engineering degrees and who are employed in science and engineering, the concentration of women and minorities in specific fields, the higher rates of part-time employment for women, the lower salaries earned by women and minorities, and the lower percentages of women in full professorships.

## Specific concerns

The report also presents data related to some specific concerns raised in the last few years:

- the declining numbers and percentages of women in computer science,
- the declining numbers and percentages of minorities in engineering,
- the effects of challenges to affirmative action on the undergraduate and graduate enrollment of minorities in science and engineering,
- the higher attrition rates of minorities in undergraduate education, and
- the paucity of data on persons with disabilities in science and engineering education.

## Broad demographic characteristics of the U.S. population

Data on the demographic composition of the population are often useful in comparing the relative percentages of groups (men and women, various racial/ethnic groups, and persons with and without disabilities) participating in science and engineering education and employment. By way of background, text tables 1 and 2 provide data on the numbers and percentages of women, minorities, and persons with disabilities in the U.S. population by age group. In 1997, women were roughly half of the resident population of the United States. Whites were 73 percent, blacks 12 percent, Hispanics 11 percent, Asians/Pacific Islanders 4 percent, and American Indians/Alaskan Natives less than 1 percent of the population. Blacks and Hispanics constituted higher percentages of the younger population (those less than 25) than of the older population. The Census Bureau estimates that in 1994–95, about 20 percent of the population had some form of disability and about 10 percent had a severe disability.<sup>1</sup> The percentage of the population with a disability increases with age.

## Racial and ethnic categories

In October 1997, the Office of Management and Budget (OMB) announced new government-wide standards for the collection of data on race and ethnicity.<sup>2</sup> Previously,

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<sup>1</sup> Estimates of the proportion of the population with disabilities vary due to differing definitions of the term “disability.” See appendix A for a discussion of the limitations of estimates of the size of this group.

<sup>2</sup> These new standards, published in the *Federal Register* as “Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity” (62 FR 58781–58790), superseded OMB Statistical Policy Directive No. 15, “Race and Ethnic Standards for Federal Statistics and Administrative Reporting,” which had been in place since 1977.

Text table 1.

**Resident population of the United States, by sex, race/ethnicity, and age: 1997 [in thousands]**

Sex and race/ethnicity	Total	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 74	75 and older
Number																
Total.....	267,636	19,150	19,738	19,040	19,068	17,512	18,869	20,741	22,625	21,373	18,470	15,163	11,757	10,056	18,499	15,577
Men.....	131,018	9,801	10,104	9,757	9,827	8,979	9,470	10,340	11,286	10,596	9,074	7,383	5,646	4,745	8,268	5,740
Women.....	136,618	9,349	9,634	9,283	9,241	8,532	9,399	10,401	11,338	10,777	9,396	7,780	6,111	5,311	10,230	9,836
White.....	194,571	12,128	12,900	12,819	12,802	11,609	12,821	14,476	16,513	16,013	14,205	12,030	9,327	8,062	17,389	13,498
Asian/Pacific Islander.....	9,443	806	745	714	683	711	847	839	825	778	662	487	364	295	659	252
Black.....	32,298	2,703	2,976	2,790	2,819	2,466	2,477	2,610	2,716	2,464	1,990	1,438	1,161	967	2,128	1,128
Hispanic.....	29,348	3,347	2,928	2,515	2,580	2,571	2,567	2,664	2,415	1,976	1,494	1,116	836	677	1,513	642
American Indian/Alaskan Native.....	1,976	166	190	202	184	155	157	152	155	142	118	92	70	55	125	60
Percent																
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Men.....	49.0	51.2	51.2	51.2	51.5	51.3	50.2	49.9	49.9	49.6	49.1	48.7	48.0	47.2	44.7	36.8
Women.....	51.0	48.8	48.8	48.8	48.5	48.7	49.8	50.1	50.1	50.4	50.9	51.3	52.0	52.8	55.3	63.1
White.....	72.7	63.3	65.4	67.3	67.1	66.3	67.9	69.8	73.0	74.9	76.9	79.3	79.3	80.2	94.0	86.7
Asian/Pacific Islander.....	3.5	4.2	3.8	3.8	3.6	4.1	4.5	4.0	3.6	3.6	3.6	3.2	3.1	2.9	3.6	1.6
Black.....	12.1	14.1	15.1	14.7	14.8	14.1	13.1	12.6	12.0	11.5	10.8	9.5	9.9	9.6	11.5	7.2
Hispanic.....	11.0	17.5	14.8	13.2	13.5	14.7	13.6	12.8	10.7	9.2	8.1	7.4	7.1	6.7	8.2	4.1
American Indian/Alaskan Native.....	0.7	0.9	1.0	1.1	1.0	0.9	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.7	0.4

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1998. *Statistical Abstract of the United States: 1998*, Washington, DC: U.S. Government Printing Office.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 2000

Text table 2.

**Population of the United States, by disability status and age: 1994–95**  
**[in thousands]**

Disability status	Total	Under 22 years	22 to 44	45 to 54	55 to 64	65 to 79	80 and older
Number							
Total.....	261,749	84,527	95,002	30,316	20,647	24,471	6,785
Any disability.....	53,907	8,473	14,105	7,412	7,497	11,568	4,853
Severe disability.....	25,968	1,472	6,071	3,472	4,528	6,798	3,627
Not severe disability.....	27,938	7,001	8,035	3,939	2,969	4,769	1,225
Percent							
Total.....	100	100	100	100	100	100	100
Any disability.....	21	10	15	24	36	47	72
Severe disability.....	10	2	6	11	22	28	53
Not severe disability.....	11	8	8	13	14	19	18

NOTE: See Appendix A, Technical Notes for definition of "severe disability."

SOURCE: U.S. Bureau of the Census, *Americans With Disabilities: 1994–95*, P70-61.(Washington, DC: U.S. Department of Commerce, 1997, <<http://www.census.gov/prod/3/97pubs/p70-61.pdf>>.)*Women, Minorities, and Persons With Disabilities in Science and Engineering: 2000*

racial/ethnic groups were identified as white, non-Hispanic; black, non-Hispanic; Hispanic; Asian or Pacific Islander; and American Indian or Alaskan Native.

Because the old standards were in effect when the data for this report were collected, the racial/ethnic groups described in this report are those designated in the old standards. In text and figure references, these groups are referred to as white, black, Hispanic, Asian, and American Indian. Where data collection permits, subgroups of the Hispanic population are identified (e.g., Mexican, Puerto Rican).

In chapters 1 to 4, data on enrollments and degrees by race/ethnicity are presented for U.S. citizens and permanent residents only. This is because some of the underlying surveys do not collect race/ethnicity data for people with temporary visas. In chapter 5 (Employment), no distinctions by citizenship are made. Less than 2 percent of employed scientists and engineers have temporary visas.

## Organization of this report

This report is organized into five chapters. The first four examine differences between men and women, among racial/ethnic groups, and between persons with and without disabilities in four areas of science and engineering education: undergraduate enrollment, undergraduate degrees, graduate enrollment, and graduate degrees. The fifth chapter examines science and engineering employment.

Because extensive information on precollege science and mathematics education is available elsewhere,<sup>3</sup> and because no new data on elementary and secondary science and mathematics achievement and course taking have been released since the previous version of this report, pre-college science and mathematics education are not addressed here. Note, however, that differences (between men and women, among racial/ethnic groups, and between students with and without disabilities) in science and mathematics achievement, as measured by elementary and secondary assessment test scores and college entrance exams, and differences in science and mathematics course taking can become a basis for differences in postsecondary science and mathematics education, employment, and technological and science literacy. For a detailed explanation of differences by sex and race/ethnicity in pre-college science and mathematics proficiency and coursework, see NSB (2000). For information on the precollege education of American Indians and Alaska Natives, see *Characteristics of American Indian and Alaska Native Education* (NCES 1997).

<sup>3</sup> See, for example, current National Center for Education Statistics reports at <<http://nces.ed.gov/pubsearch/index.asp>>.

## New Racial/Ethnic Classifications

The new OMB standards for collecting data on race and ethnicity give individuals the option of selecting one or more racial categories from among the following five racial categories:

- **American Indian or Alaska Native.** A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
- **Asian.** A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
- **Black or African American.** A person having origins in any of the black racial groups of Africa. Terms such as “Haitian” or “Negro” can be used in addition to “Black or African American.”
- **Native Hawaiian or Other Pacific Islander.** A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- **White.** A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

The standards also provide for the collection of data on whether or not a person is of “Hispanic or Latino” culture or origin. This category is defined as follows:

- **Hispanic or Latino.** A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race. The term, “Spanish origin,” can be used in addition to “Hispanic or Latino.”

The new standards differ from the old in that:

- Respondents may select more than one racial category.
- The Asian/Pacific Islander category was split into two separate categories: one for Asian and one for Native Hawaiian or Other Pacific Islander.

Several changes were made in terminology and definition:

- The term “Alaska Native” replaces the term “Alaskan Native” in the American Indian or Alaskan Native category, and the definition was expanded to include peoples of South America (including Central America).
- Examples of countries were included in the definition of Asian (e.g., China, India, Vietnam, Philippine Islands).
- The black category added “or African American.”
- The Hispanic category added “or Latino.”

The new standards are being used in the 2000 decennial census; all Federal agencies are required to adopt the standards by January 1, 2003. For more information about the new standards, see OMB (1999).

## Data sources, availability, and reliability

The data underlying this report come from a number of Federal and non-Federal sources, primarily surveys conducted by the National Science Foundation’s Division of Science Resources Studies and the National Center for Education Statistics.

To the extent possible, long-term trends are examined herein. The availability of trend data, however, differs depending on the groups examined and the specific data series in question. For some groups and some data—for

example, science and engineering degrees granted to women—longer time trend data are available; for others—for example, science and engineering employment—the time series are much shorter. Most of the data presented are through the year 1997, the latest available as of the writing of this report.

### Statistical reliability

Some of the data sources used in this report are sample surveys and therefore have differing degrees of reliability. This report states differences in comparisons of groups

or in trends in the data over time only if they are statistically significant at the 95 percent confidence level (i.e., the reported difference could be due to chance only 5 or fewer times in 100). Where possible, the impact of nonsampling errors such as incomplete coverage and nonresponse has been taken into account in the report's analyses. For more information on the statistical reliability, limitations, and availability of the data presented in this report, see appendix A, Technical Notes.

## References

- National Science Board (NSB). 2000. *Science & Engineering Indicators—2000*. NSB 00-1. Arlington, VA.
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- National Center for Education Statistics (NCES). 1997. *Characteristics of American Indian and Alaska Native Education*. NCES 97-451. Washington, DC: U.S. Government Printing Office.
- Office of Management and Budget. 1999. "Draft Provisional Guidance on the Implementation of the 1997 Standards for the Collection of Federal Data on Race and Ethnicity." <<http://www.whitehouse.gov/OMB/infoereg/race.pdf>>.

